100mA / 50V Digital transistors (with built-in resistors)

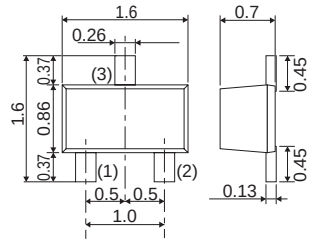
DTC143TEB

●Applications
Inverter, Interface, Driver

●Features
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
3) Only the on/off conditions need to be set for operation, making the device design easy.

●Dimensions (Unit : mm)

EMT3F



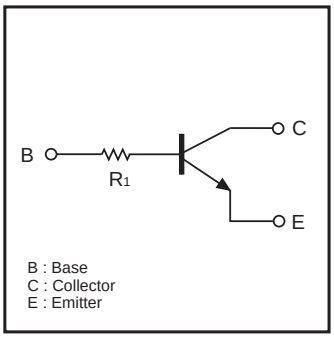
(1) Base
(2) Emitter
(3) Collector

Each lead has same dimensions

Abbreviated symbol : 03

●Structure
NPN silicon epitaxial planar transistor type
(Resistor built-in)

●Equivalent circuit



B : Base
C : Collector
E : Emitter

R_1=4.7kΩ

●Packaging specifications

Part No.	Package	EMT3F
	Packaging type	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
DTC143TEB		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base voltage	V_{CBO}	50	V
Collector-Emitter voltage	V_{CEO}	50	V
Emitter-Base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA
Power dissipation	P_D *1	150	mW
Junction temperature	Tj	150	°C
Range of Storage temperature	Tstg	−55 to +150	°C

*1 Each terminal mounted on a recommended land

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	50	–	–	V	I_C=1mA
Collector-base breakdown voltage	BV_{CBO}	50	–	–	V	I_C=50μA
Emitter-base breakdown voltage	BV_{EBO}	5	–	–	V	I_E=50μA
Collector cut-off current	I_{CBO}	–	–	500	nA	V_{CB}=50V
Emitter cut-off current	I_{EBO}	–	–	500	nA	V_{EB}=4V
Collector-emitter saturation voltage	$V_{CE(sat)}$	–	–	150	mV	I_C/I_B=5mA/0.25mA
DC current gain	h_{FE}	100	250	600	–	V_{CE}=5V, I_C=1mA
Transition frequency	f_T *	–	250	–	MHz	V_{CE}=10V, I_E=–5mA, f=100MHz
Inputa resistance	R	3.5	4.7	5.9	kΩ	–

* Characteristics of built-in transistor

●Electrical characteristic curves

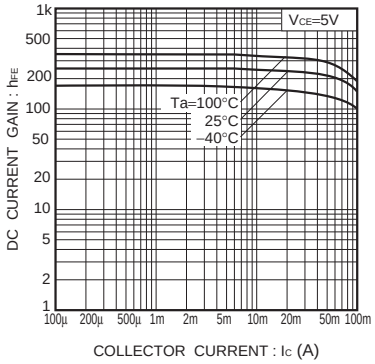


Fig.1 DC current gain vs. collector current

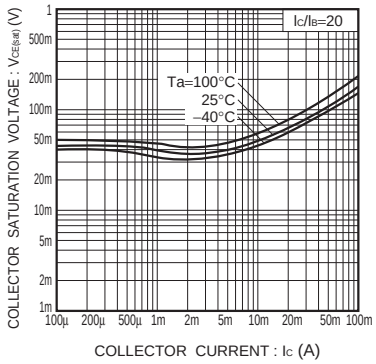


Fig.2 Collector-emitter saturation voltage vs. collector current

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